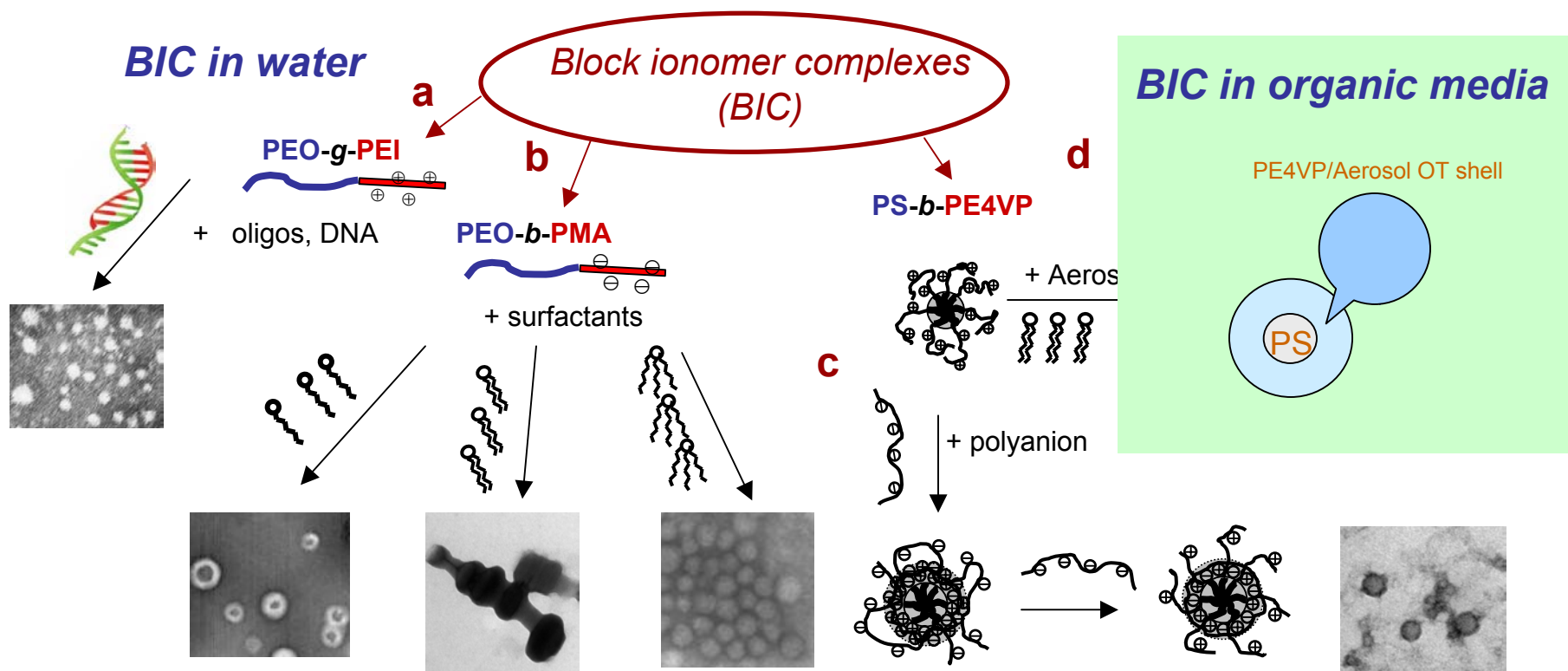


# Nanomaterials: Block Ionomer Complexes

(DMR-0071682 “Complexes of Block Ionomers with Oppositely Charged Surfactants” PI: Alexander Kabanov, UNMC)

Partner Organizations: McGill University, Canada; Moscow State University, Russia

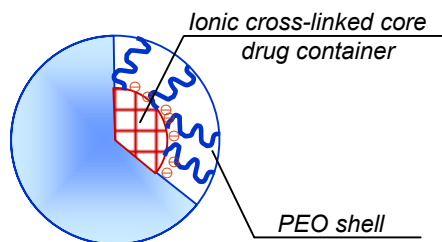


**Nanostructured materials obtained by self-assembly of block ionomers with species of opposite charge:** Water-dispersed BIC with poly(ethylene oxide) corona and shell formed by ionic block and (a) DNA or (b) surfactants. Water-dispersed BIC with polystyrene (PS) core, polyelectrolyte complex layer, and a shell from “lyophilizing” polyelectrolyte (c). BIC dispersed in organic solvent with PS core and polyelectrolyte-surfactant complex shell.

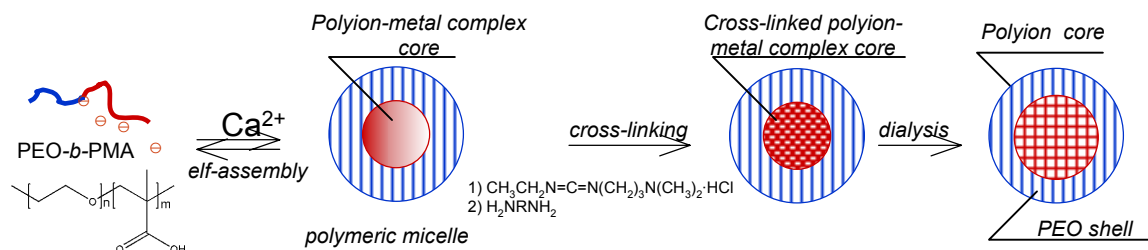
# Polymer Micelles with Cross-Linked Ionic Core

(DMR-0071682 “Complexes of Block Ionomers with Oppositely Charged Surfactants” PI: Alexander Kabanov, UNMC)

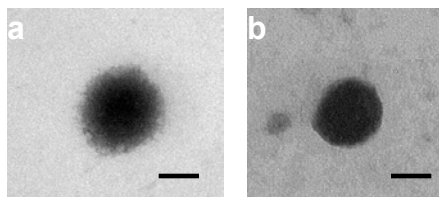
Partner Organizations: McGill University, Canada; Moscow State University, Russia



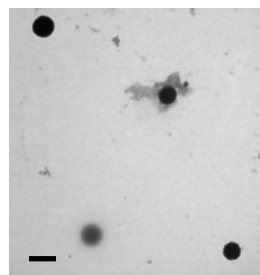
**Fig. 1** Polymeric micelle with cross-linked ionic core



**Fig. 2** Synthesis of polymer micelles with cross-linked ionic core



**Fig. 3** TEM images of (a) PEO-*b*-PMA/Ca<sup>2+</sup> micelle and (b) cross-linked polymer micelle (25% cross-linking). Bar = 100 nm.



**Fig. 4** Cross-linked polymer micelles loaded with cisplatin. Bar = 200 nm

## Polymer Micelles with Cross-Linked Ionic Core:

BIC technology enables fabrication of new innovative carriers for cisplatin drug delivery. Technology co-invented by Dr. Tatiana Bronich, a mentored junior faculty, polymer scientist, (Patents pending)

## Broader impact:

- Technology resulting from NSF grant developed by PI and Dr. T. Bronich
- Dr. Bronich submitted a grant to NIH “A cross-linked polymer micelle for cancer therapy”
- New graduate course in “Polymer Therapeutics” taught at UNMC by PI and Dr. Bronich
- 5 graduate students trained (1 supported by this award)
- US-Japan Minisymposium on “Nanomedicine and Drug Delivery” (UNMC, January 6-7 2003)